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BOSTON UNIVERSITY

GRADUATE SCHOOL

Thesis

THE APPLE INDUSTRY IN THE UNITED STATES

by

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(S.B., Simmons College, 1930)  
submitted in partial fulfillment of the  
requirements for the degree of  
Master of Arts  
1944



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Doctor of Philosophy

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## THE APPLE INDUSTRY IN THE UNITED STATES.

### Introduction.

The big red apple, highly burnished and displayed with other carefully wrapped apples in a box, is a long way removed from the puckery crab, found beneath a thorny wild apple tree growing on a wooded hillside, or from the indifferent looking apple on the old tree behind the barn. These apples are the epitome of the history of the apple industry, which had simple beginnings, became highly specialized, and has now reached a status of non-expansion and equilibrium, perhaps even of decline.

The economic history of apple growing goes back to the nativity of the cultivated apple, and to its dissemination throughout the Northern Hemisphere, and especially throughout the United States. Early apple raising was a home and farm industry; but after 1850, with the industrialization of America, came large-scale agriculture and commercial apple growing in the regions best suited to apple culture. After 1890, and more particularly after 1917, the apple industry exhibited many of the economic characteristics common to other agricultural industries, as well as some peculiar to itself.

To trace in detail the story of the big red apple industry, to look at it with historical perspective, and to examine it for its economic characteristics is the hope and aim of the various portions of this study.

# THE HISTORY OF THE UNITED STATES

OF THE

The history of the United States is a story of growth and change. It begins with the first settlers, who came to the Americas in search of a new life. They found a land of opportunity, but also a land of challenge. The early years were marked by struggle and hardship, but the spirit of the pioneers was unyielding. They built a nation from scratch, one that was based on the principles of freedom and democracy. Over time, the United States grew in size and power, becoming a global superpower. It has faced many challenges, from war to economic crisis, but it has always emerged stronger and more united. The history of the United States is a testament to the power of the human spirit and the ability of a nation to overcome adversity.

Part I - **Apple Growing** before 1850 and Dissemination  
of the Apple in the United States.

The apple has always been one of the most important of the fruits. It comes to us from prehistoric times. One proof of its early existence is its appearance among the remains of the early lake dwellers of Switzerland. The exact home of the apple is uncertain, some authorities<sup>1/</sup> claiming that it came from Asia; others, from the region south of the Caucasus near the Caspian Sea. Its source could have been almost anywhere in the Northern Hemisphere, because the wild apple, or crab, is found in Europe, Asia, and North America.

The wild apple is found in several varieties. The most common form is the pyrus bacata, or Siberian Crab. In the United States, there is also the Prairie Crab, pyrus ioensis; the Eastern States Crab, pyrus coronaria; and the Northern Pacific Crab, pyrus rivularis. The last named bears a yellow-red fruit, which was used as a food by the Chinooks.<sup>2/</sup> The cultivated apple, pyrus malus, is not indigenous to this country, but was brought here by the first settlers. Later, it was also carried to New Zealand and Australia, so that today the apple is successfully grown in both hemispheres.

The cultivated apple came to the United States as part of the essential goods of the colonist. Both seeds and seedlings  
<sup>1/</sup> Bailey, L.H. The Apple Tree. N.Y., Macmillan, 1922, p.61.  
<sup>2/</sup> Americana, 1931, v.2.





were brought from the orchards of Europe to provide fruit in the new world. The seeds were used to start nurseries; while the seedlings went directly into orchard plantings.

In Massachusetts, Governor Endicott had one of the first orchards on Governor's Island in Boston Harbor. He also had a nursery there. In 1639, just nineteen years after the landing of the Pilgrims, the trees that he had planted bore their first crop. In 1644, misfortune came to the orchard, when five hundred trees were destroyed by fire.<sup>3/</sup> Governor Endicott, however, must have had an extensive nursery; for only four years later, in 1648, he exchanged five hundred three-year old apple trees for two hundred acres of land.<sup>4/</sup> From this transaction, it would seem that apple trees were a rare and valuable commodity in Colonial Massachusetts. Numerous other plantings were made throughout the colony prior to 1700, many of these undoubtedly from Governor Endicott's stock. From these colonial orchards, the apple spread through New England to form later the large farm orchards of the region, an integral part of the diversified farming now practiced.

In New York, the story is similar. Dutch colonists brought the apple to Manhattan. From there, it was carried up the Hudson and along the Mohawk, until trees were planted in the Finger Lake country and along the shores of Lake Ontario and

<sup>3/</sup> Bailey, L.H. The Apple Tree. N.Y., Macmillan, 1922, p.61.

<sup>4/</sup> Folger, J.S. and Thompson, S.M. The Commercial Apple Industry of North America. N.Y., Macmillan, 1921, p.20.

1. The first part of the document is a letter from the President of the United States to the Congress, dated January 3, 1862. It contains a report on the state of the Union and the progress of the war against the rebellion. The President mentions the recent victories of the Union forces and expresses confidence in the ultimate success of the cause.

2. The second part of the document is a report from the Secretary of the Treasury, dated January 10, 1862. It details the financial condition of the government and the measures taken to meet the demands of the war. The report notes the increase in public debt and the need for further financial support.

3. The third part of the document is a report from the Secretary of the Interior, dated January 15, 1862. It discusses the management of the public lands and the progress of the reclamation work. The report mentions the discovery of gold in California and the need for increased supervision of the mining industry.

4. The fourth part of the document is a report from the Secretary of the Navy, dated January 20, 1862. It describes the state of the naval forces and the progress of the construction of new ships. The report notes the success of the fleet in the Gulf of Mexico and the need for further expansion of the navy.

5. The fifth part of the document is a report from the Secretary of the War, dated January 25, 1862. It provides a detailed account of the military operations and the progress of the war. The report mentions the recent battles and the need for increased military support.

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7. The seventh part of the document is a report from the Secretary of the Education, dated February 5, 1862. It describes the state of the public schools and the progress of the educational reforms. The report notes the success of the new curriculum and the need for further investment in education.

8. The eighth part of the document is a report from the Secretary of the Agriculture, dated February 10, 1862. It discusses the state of the agricultural industry and the progress of the reclamation work. The report mentions the success of the new farming techniques and the need for continued support of the agricultural sector.

9. The ninth part of the document is a report from the Secretary of the Commerce, dated February 15, 1862. It describes the state of the commercial industry and the progress of the trade relations. The report notes the success of the new trade agreements and the need for continued support of the commercial sector.

10. The tenth part of the document is a report from the Secretary of the Finance, dated February 20, 1862. It discusses the state of the financial industry and the progress of the monetary reforms. The report mentions the success of the new currency and the need for continued support of the financial sector.



Lake Erie, a section destined to become one of the greatest apple growing districts of the country. The very earliest orchards here were planted by the Indians of the Five Nations,<sup>5/</sup> who recognized that apples were well worth their efforts. They obtained their stock from the colonists. The remains of these Indian orchards may still be discerned in some parts of Western New York, having survived to the present day.

In the South, as in the North, apples were likewise an essential part of the home orchard. Only in the South more kinds of fruit could be grown, and apples were merely one fruit among a host of others. For this reason, the apple occupied a somewhat smaller place in the agricultural economy of the South than in the other colonies.

The universal appearance of the apple in Colonial America raises the query: Why did all of the colonies grow apples? The answer may be expressed in a single word: Cider. The apples of this period were for drinking, not for eating. As we well know, prodigious quantities of cider were consumed at barn raisings, at husking bees, and at work in the fields. Cider also was an article of export. Apples, themselves, were shipped to the West Indies to be made into cider there.<sup>6/</sup> Hugh Jones (1724), at one time a professor at William and Mary College and chaplain to the House of Burgesses of Virginia,

<sup>5/</sup> Bailey, L.H. The Apple Tree. N.Y., Macmillan, 1922, p.61.

<sup>6/</sup> Carrier, L. The Beginnings of Agriculture in America. N.Y., McGraw-Hill, 1923, p.162.



shows in his "Present State of Virginia Sabines"<sup>7/</sup> the status and use of the colonial apple orchard. He says:

"The Peaches abound, and are of delicious Taste, and Apple-trees are raised from the Seeds very soon, which kind of Kernel Fruit needs no grafting, and is diversify'd into numberless Sorts, and makes, with good Management, an excellent Cyder, not much inferior to that of Herfordshire, when kept to a good Age; which is rarely done, the Planters being good Companions and Guests whilst the Cyder lasts."

After the Revolution, the apple went westward with the settlers. It spread along the Ohio River and up into Indiana, Illinois and Michigan; it moved down the Mississippi, overtaking the orchards planted many years before by the French fur traders, and reaching out into the Ozarks of Missouri; it crept into the covered wagon and rumbled on to Oregon and Washington. The apple followed the progress of land settlement in the United States. Its regional industrial development came afterward in the sections which had climatic conditions most favorable for its propagation. General dissemination of the apple, however, was nation-wide.

The part played by Johnny Appleseed (John Chapman, 1768-<sup>8/</sup>1847) in the westward travels of the apple should be mentioned at this point. Born near Springfield, Massachusetts, he was educated at Harvard. While a student, he became a disciple of Swedenborg. For a time he was a Swedenborgian missionary along the Potomac in Virginia. He was a mystical dreamer, who

<sup>7/</sup> Carrier, L. The Beginnings of Agriculture in America. N.Y., McGraw-Hill, 1923, p.289.

<sup>8/</sup> Pershing, H.H. Johnny Appleseed and His Time. Strasburg, Va., Shenandoah Publishing House, 1930.

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was charmed by the birds, the flowers, the trees, and, especially, by the apple trees with their lovely blossoms and interesting trunks. It is said that he would stand enthralled before an apple tree for hours.

After the Revolution, Chapman caught the westward fever. With his brother Nathaniel, he journeyed on foot to Pittsburgh. From there, the brothers went to Olean, New York, to visit their uncle. The uncle, however, had left for the West; and they found only his deserted cabin, where they spent the winter. While here, John conceived the idea of becoming a missionary of the apple.

During the winter, the brothers filled some twenty-five bags with apple seeds which they segregated from pomace and then dried. In the spring, they set forth down the river to Pittsburgh, planting orchards as they went. They would scrap a rude clearing along the bank, sow the seeds, roughly fence it with brush, and leave it. Then, if the seeds matured properly, there would be seedlings ready for the future settlers to carry with them. Nathaniel soon returned to his home from Pittsburgh; but John remained to become the legendary Johnny Appleseed.

Many are the tales told of him and of the hundreds of orchards he planted in this fashion in Ohio, Indiana, Illinois, and Kentucky. He would give seeds or seedlings to anyone. He expected and hoped that settlers moving west would carry his seedlings with them. Occasionally he sold a few; but, for the most part, he existed on the kindness and generosity of the



people among whom he wandered. He was beloved by the settlers in these states. Today, his memory is perpetuated by several monuments attesting to his service to mankind and the apple.

Perhaps the most famous apple trees to go west were those carried by Luelling in 1848. His celebrated traveling nursery went overland from Salem, Iowa, to Milwaukee, near Portland, Oregon, in 1847.<sup>9/</sup> The journey took six months. Apple seedlings, along with other fruits suitable to the environment of Iowa, were packed into boxes containing an equal mixture of earth and charcoal. These were fitted into a wagon bed, which was drawn by oxen. The various seedlings stood from 20 inches to 4 feet in the boxes. It must have been quite a sight to see this nursery leaving Salem. Luelling's daughter, Eliza, took charge of the plants; and they were watered every day. If water was scarce, the plants got all they needed, while the Luellings and the oxen went thirsty.

On their arrival at The Dalles, Oregon, the plants were unpacked, wrapped in cloth and placed in wagons on boats to go down the Columbia River to Milwaukee. Here, in 1848, Luelling planted the first orchard from grafted fruit in Oregon. Shortly, after this, with his friend, William Meek, he established the Luelling-Meek Nursery, which became the mother of Oregon nurseries.

It would be pleasant to relate that from this travelling

<sup>9/</sup> Ellison, J.W. The Beginnings of the Apple Industry in Oregon.  
In Agricultural History, Vol.2, no.4, Oct.1937, p.326-327.





nursery came the first cultivated apples to the Northwest; but the apple actually arrived at Fort Vancouver in 1825. The tale of this journey is equally colorful.<sup>10/</sup>

In London, in 1824, a dinner was given to honor Captain Simpson and his men, who were about to depart for the Pacific Northwest. One of the guests, a young lady, jestingly told the Captain to plant some apple seeds in the new country. These she had extracted from the dessert (probably an apple tart) and dropped into his pocket. When Captain Simpson was dining at Fort Vancouver some time afterwards, he found the seeds and presented them to James Bryce, who was an expert gardener for the Hudson's Bay Company. Bryce planted the seeds and successfully raised from them the first cultivated apples in the Pacific Northwest.

The early history of the apple industry is full of these anecdotes and stories. They are the accompaniment of the times, engendered by all pioneer undertakings. The economics of the industry, likewise, was comparable to the agricultural economy of the times.

Agricultural methods and farming in the early days of the United States were, as we now know, crude, wasteful, and unprogressive, with extensive exploitation of the soil. Wherever the colonist settled, he only rudely cleared enough land to plant the crops necessary to insure his existence. About the

<sup>10/</sup> Ellison, J.W. The Beginnings of the Apple Industry in Oregon. In Agricultural History, Vol.2, no.4, Oct.1937, p.325, footnote.



second year of his tenure, he would set out an orchard to provide fruit to vary his diet and to give him cider and wine. While he might clear more land from time to time for his annual crops, he would seldom enlarge or renew his orchard, because of the longevity and continued bearing of the trees. Nor would he give them any care. Pruning, fertilizing and complete disposal of the crop were never practiced; as a general rule only the fruits that could be used were harvested. Most of the pears, peaches, and cherries would go to waste; a greater proportion of the apples was used, as several hogsheads of cider were to be found annually in every cellar.

Advancement in orcharding techniques and in the cultivation of apples came with the general improvement in agricultural methods in the first part of the nineteenth century. From 1820, a great interest in horticulture arose. This, among other things is attested by the numerous horticultural journals of the period, such as the American Farmer and The Massachusetts Agricultural Repository and Journal. The articles in these periodicals reflect the changes in scientific agriculture in Europe, which had been already fathered by Arthur Young and Sir John Sinclair in England in the latter part of the eighteenth century.

These journals and writers did much to further changes and improvements in crop management. While the average farmer scoffed loudly at the printed treatises, secretly he tried some of the innovations recommended. Crop rotation and fertili-





zation were adopted because the virgin fertility of the new soil was becoming exhausted, and because the farmer was now turning to greater production as a source of livelihood. Hitherto, he had been concerned with producing only enough food for existence.

One of the proofs of the interest in agricultural and horticultural improvements is the increase in the kinds of apples grown. In the seventeenth century, the Pearmain, the Russetin, the Long Apple, and the Kreton Pippins were the common varieties in New England. Probably there were not more than a dozen types on the whole Eastern Seaboard. About 1750, the Baldwin was developed near Lowell, Massachusetts; and in 1800, the Northern Spy appeared in New York. Bernard M'Mahon published in 1806 A Select List of Fruit Trees, which included 60 kinds of apples. Six or eight of these are recognizable today. Testing of varieties continued all through the nineteenth century. Leaders in this were A.J. Downing and his <sup>11/</sup>brother, Charles Downing, at their Newburgh, New York, nursery. Likewise, from 1840, George Ellwanger and Patrick Barry did much at the Mt. Hope Nursery in Rochester, New York. Barry, in particular, was responsible for making Western New York the leading nursery and apple growing region. Between 1820 and 1872, experimentation was so successful that in Downing's Fruits and Fruit Trees of America, 1872, appear 1856 varieties, <sup>11/</sup>Folger, J.S. and Thompson, S.M. The Commercial Apple Industry of North America. N.Y., Macmillan, 1921, p.21-22.



1099 of which were American in origin, 585 foreign, and 172 unknown.

Unfortunately, although we know about all these kinds of apples, we have no production data. This is because apple growing, despite its tremendous advances, was not yet a large venture and because the U. S. Department of Agriculture was not yet organized. What orchards and nurseries there were were relatively small and isolated. Slight beginnings were evident in New England, in the Piedmont of Virginia, and, especially, in New York. The census of 1850 gives the value of orchard products by states as \$7,256,904;<sup>12/</sup> but no attempt is made to segregate apples from other fruits. Also the census data includes home and farm orchards showing no distinction between them and business ventures.

In 1850, however, the scene was set for the beginnings of large-scale apple growing in the United States. The apple, itself, had been carried to every part of the country; and in the regions most favorable to its culture, nurseries and small specialized orchards were appearing. After the Civil War came the great expansion in apple growing with its shift from extensive to intensive methods of production.

<sup>12/</sup> U. S. Census Office. Seventh Census of the United States:  
1850, p.lxxiii.

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Part II - Regional Development of the Apple Industry  
since 1850.<sup>13/</sup>

After 1850, development of the apple regions of the United States came in those sections the climatic conditions of which were most favorable for growing apples. The apple, for its successful maturing, requires a coarse gravel soil, good air drainage, moisture, sufficient sun to ripen the fruit, and moderate temperatures. The piedmont districts and rolling hill sections are the most propitious. Irrigation has supplied the one essential lacking in the West and has enabled fruit to be grown where the normal amount of rainfall is deficient. The additional sunshine in these dry districts gives the apples a particularly brilliant, reddish color, which has done much to make western apples famous.

-----

Apple Growing in Oregon.

<sup>14/</sup>In Oregon, apple growing developed from the Luelling-Meek nursery referred to earlier in this study. By 1853, the company had four branches in Oregon, and apples were commanding fabulous prices, both locally and in California. The first box of apples sold by Henderson Luelling in Portland returned

<sup>13/</sup> Acknowledgment for much of the information in Part II should be made to Chapter II of The Commercial Apple Industry of North America by J.S. Folger and S.M. Thomson, N.Y., Macmillan, 1921.

<sup>14/</sup> For the history of Oregon apple growing in detail see The Beginnings of the Apple Industry in Oregon by J. S. Ellison in "Agricultural History", Vol.2, no.4, October 1937, p.322-343.



a net profit of \$75.00. Spitzenburgs of average size sold for \$.75 each. In the same year, Luelling took a load of apples to San Francisco and sold them at \$2.00 a pound, or \$100.00 for one of the standard apple boxes commonly used today. By 1856, shipments of apples to California amounted to 20,000 boxes annually, with the monthly shipments to San Francisco by steamer averaging 4500 boxes until 1869.

The remarkable market for apples in these years caused a great many small orchards to be planted. Conditions in Oregon were advantageous to the new, inexperienced grower as he had virgin, fertile soil, a benificent climate, and no bugs or pests to fight. Winesaps and Baldwins were the predominant varieties. Their beautiful appearance won for Oregon the sobriquet, "The land of the big red apples".

Oregon's enviable monopoly of the industry on the West Coast was relatively short-lived. Its decline was precipitated by four factors: the loss of the San Francisco market, the competition of earlier-ripening California fruits in Oregon, the appearance of insects and pests brought in with these fruits, and overproduction from the new trees that were just coming into bearing. This situation led to neglect of the orchards; to an increase of green and wooly aphids, the coddling moth, and San Jose scale; and to an eventual decrease in crops in Oregon in the eighties and nineties.

Revival came to the Oregon apple industry with the coming of three transcontinental railroads, which opened the markets

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4. The fourth part of the document discusses the implications of the findings. It suggests that the results of the study have significant implications for the field of research and may lead to further developments in the future.

5. The fifth part of the document concludes the study. It summarizes the main findings and reiterates the importance of the research. It also acknowledges the limitations of the study and suggests areas for future research.



in the East to Oregon apples. Planting of orchards was resumed until in 1900 Oregon had about 2,000,000 trees, which were concentrated in the Hood River District. Oregon orchardists learned early to specialize on a few kinds of apples, since large buyers in distant markets were not interested in odd-lot shipments of several varieties and to grow and pack only quality fruit. After 1900, competition between the Western States for the eastern and export markets was so great that intensive, scientific methods of cultivation were adopted in Oregon.

-----

#### Development in Washington.

In contrast with Oregon, the growth of the apple industry in Washington was much slower, not starting until 1888 in the Yakima Valley, and 1900 in the Wenatchee. The beginning of apple orchards was correlated with the coming of the railroad and the opening of the Wenatchee Highland Canal, which brought water to the valley. These circumstances and the scarcity of land suitable for apple growing forced the growers to adopt the intensive methods already initiated in Oregon.

So today the orchards are concentrated in the Yakima and Wenatchee Valleys, and in the Spokane and Walla Walla districts. The average orchard is very small, six to ten acres; clean or leguminous cover-crop cultivation is practiced; and practically no other crops except apples are produced. Total investment, consequently, is very high, the average per acre being about \$2000. At the same time, the land is unsur-

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4. The fourth part discusses the role of technology in enhancing data management processes. It explores various software solutions and tools that can streamline data collection, storage, and analysis.

5. The fifth part focuses on the importance of training and education for staff members. It stresses that all employees must be well-versed in the organization's data management policies and procedures to ensure consistent and accurate data handling.

6. The sixth part provides a summary of the key points discussed in the document. It reiterates the commitment to maintaining high standards of data management and the ongoing effort to improve these processes.

7. The final part includes a list of references and a glossary of terms used throughout the document. This ensures that all readers have access to the necessary information and can understand the terminology used.

passed in productivity and the high marketable quality of its fruit. The result has been to give Washington a preeminent place as the most important apple growing section of the country. This position it attained about 1917.

-----

#### The Situation in California.

California, the last of the chief western apple growing states, occupies a lesser place in the industry than either Washington or Oregon. Orchards in the state center mostly around Watsonville, all of the important ones being grouped within five or ten miles of the town. The intensity of plantings in this district is exceeded only by that in the Wenatchee Valley of Washington, and this section accounts for two-thirds of the production of the state.

The first commercial orchard bore fruit near Watsonville in 1870, with the period of greatest expansion coming between 1890 and 1900. Yellow Newtown and Yellow Bellflower are the two most important varieties. These apples are usually exported, as a yellow or a green apple does not sell at all successfully in the United States. The fact that these varieties are the only ones that grow and produce in quantity in this district has been a decided limitation.

Another factor that has lessened the value of the California apple crop is the speculative practice of leasing or selling the crop in advance to buyers, who pick, pack and market the fruit. These buyers assume the entire risk of the

1. The first part of the document is a letter from the President of the United States to the Congress, dated January 3, 1801. It contains a report on the state of the Union and the progress of the government during the year 1800. The President mentions the peace with France and the establishment of the new government.

2. The second part of the document is a report from the Secretary of the Treasury, dated January 3, 1801. It contains a detailed account of the financial state of the country, including the revenue and the debt. The Secretary also mentions the progress of the public works and the state of the commerce.

3. The third part of the document is a report from the Secretary of the Navy, dated January 3, 1801. It contains a detailed account of the naval operations and the state of the fleet. The Secretary also mentions the progress of the naval construction and the state of the naval stores.

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5. The fifth part of the document is a report from the Secretary of the Interior, dated January 3, 1801. It contains a detailed account of the land and the minerals of the country, including the progress of the land survey and the state of the mineral resources.

6. The sixth part of the document is a report from the Secretary of the Education, dated January 3, 1801. It contains a detailed account of the state of the education in the country, including the progress of the schools and the state of the teachers.

7. The seventh part of the document is a report from the Secretary of the Agriculture, dated January 3, 1801. It contains a detailed account of the state of the agriculture in the country, including the progress of the crops and the state of the farmers.

8. The eighth part of the document is a report from the Secretary of the Commerce, dated January 3, 1801. It contains a detailed account of the state of the commerce in the country, including the progress of the trade and the state of the merchants.

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crop. They also do what spraying, pruning, and fertilizing they deem necessary to insure them a return. Naturally, these transactions do not benefit the orchard, for the buyers are only going to care for the orchard enough to cover themselves. Sometimes these contracts for the crops are for a number of years, which virtually amounts to absentee landlordism. It is fortunate for the apple industry as a whole that this type of orchard management is peculiar to California.

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### Colorado and the Rocky Mountain Orchards

Apple orchards are scattered all along the North-South axis of the Rocky Mountains, the principal development being on the western slope in Colorado and Montana. The plantings in Colorado far outrank those of Montana and are comparable with those of the Northwest, producing boxed apples, relying on irrigation, marketing through cooperatives, and using similar methods of culture and farm management generally.

Largest orchards are in the Grand Valley and in Delta, Montrose, and Fremont counties. These were planted between 1905 and 1910; few orchards were set in the period 1912-1918. Alkali outcroppings caused some decline in the acreage planted, which was probably 2,000 to 3,000 acres. Colorado orchards are at their maximum productivity now. The average crop between 1928 and 1937 was 1,900 bushels. In 1938, 2100 bushels were harvested.

Apple production in Colorado has had its difficulties. Inflation of land values, similar to that in Washington; difficulties with irrigation systems; and the menace of the codling moth

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have hampered production. However, as regards the nearer proximity to markets, Colorado orchardists have an advantage over states farther west. The soil and climate are particularly adapted to the growing of Jonathan apples, which comprise nearly a third of the crop. Winesap, Ben Davis, Pippin, Gano and Rome Beauty are among the other important varieties. A distinctive feature of Colorado apple plantings is that they occur at an elevation of 4,000 to 5,000 feet above sea level.

In Montana, on the other hand, apple growing is in a state of decline. At one time, in the Bitter Root Valley extending between Missoula and Hamilton, over 23,000 acres were planted. These orchards were in large projects, which went into receivership and have since been neglected. McIntosh is the variety best suited to the region, but the trees do not attain a large size, annual growth being small. The nation-wide slump in apple promotion after 1912 came to Montana at an inopportune time, with the result that much of its acreage and production was lost.

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#### The Regions in New York State

In the East, the single largest apple raising state is New York. Production centers in the western portion, with the Hudson River Valley and the shores of Lake Champlain as secondary regions. Until 1917, New York led the country in production; and even today, it holds the lead in acreage and number of trees.

The big commercial orchards in New York were planted very early, so that by 1860 the importance of the region was apparent. Most of the trees are located in Niagara, Monroe, Orleans and





Wayne counties, which border on Lake Ontario and have a total acreage of between 100,000 and 120,000 acres. Each county is capable of producing a million barrels of apples annually.

Nowhere else in the United States do apple trees produce as long as in these counties, the average tree being forty years old. This continuity of vigor and productiveness has been a tremendous asset to the grower, who has been able to count on maximum crops from his orchard for thirty years.

Orchards in New York are customarily part of a larger farm of 100 acres or more, the apple trees occupying from 10 to 20 acres. This means that diversified farming can be carried on, with other crops providing an income in the years when the apple crop fails. Thus, intensity of planting is not as great as in the West, land values have been consistently lower, around \$500 per acre of orchard, and the risks attached to specialization have been mitigated.

From New York orchards came for many years the bulk of the barreled apple crop. Much of it went to the export trade from the ports of New York and Montreal; the remainder was sold in the local and New York markets. Since 1920, New York has turned with the rest of the Northeast to the boxed apple, to meet the competition of fruit from the West. Also, the grower has discovered that a box fetches nearly the same price as a barrel, which contains almost three times as many apples.

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#### In New England

The second most important region in the East is New England.





Any single state in this group is less important than Virginia; but because of the homogeneity of the region and its comparatively compact area, it is best to consider the six states as a single producing unit.

Production in New England lies in the so-called New England Baldwin Belt, extending from Southern Maine through New Hampshire, Massachusetts, and Connecticut. The sections are small and intensive, production being localized in a few counties in each state.

New England is perhaps the oldest apple region in the country. Its farm orchards, together with those of New York and Virginia, provided apples for sale long before large-scale orcharding really began. New England trees, like those of New York, are old. Great numbers of them have gone out of bearing, especially during the severe winters of 1917-18 and 1933-34, when terrific damage was done to the older Baldwins.

The seven varieties specialized in are ones best suited to the climate and the thin soil of the region. They are the Northern Spy, the Cortland, the Rhode Island Greening, the Gravenstein, the Wealthy, the McIntosh, and the Baldwin. The last two are the most common. The Gravenstein and the Wealthy provide early apples for the market, the McIntosh and Greening are fall apples suitable for holding in storage, and the Baldwin and Northern Spy are winter fruits. The best fall and winter packs are habitually held in storage for the higher spring prices.

Most of the apples are sold on the Boston market, coming in by truck. A small percentabe is shipped to New York; and

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prior to the failure of the export market, some went overseas.

The outlook for New England is for decreasing production in the region as a whole. Competition from Virginia and western apples is hard to meet, with the result that new plantings are not being made, except in certain especially favorable regions of Massachusetts and New Hampshire. Resumption of the export trade would stimulate production somewhat.

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#### Apple Regions in Virginia and West Virginia.

In contrast to New England, Virginia and West Virginia form a growing apple region. Trees are younger, and total acreage in the Shenandoah-Cumberland and Piedmont regions is larger. The first of these regions is the more important. In intensity, the plantings equal those of the Northwest; in productivity, the orchards exceed those of New England and approach those of New York. The second of these regions is less important as the trees are found in mountainous orchards, difficult and expensive to work. The trees are older and there are few new orchards. The Piedmont region is particularly notable for its historic Albermarle Pippin apples, long favored in the markets of England.

The younger plantings of Stayman, York Imperial, and Ben Davis apples in the Shenandoah are just coming into full production now so that shipments to the New York market are seriously affecting the demand for New York and New England apples. This situation is particularly acute in the early





fall at the height of the picking season, when most Virginia apples, due to their poorer keeping qualities, flood the market. Virginia apples do not seriously affect the Northern apples which have been held in storage, because by the time the latter come on the market the flow of the Virginia crop has ebbed and its effectiveness as a price depressant has dissipated.

For many years, however, Virginia apples will be an important market factor; and the Shenandoah-Cumberland region will be one of the great apple areas of the country. A revived export trade, or development of other uses for apples, a problem on which Virginian orchardists have been doing much research, would do much to dispose of the crop more advantageously.

#### -----

#### Other Regions.

Other important apple regions in the United States are in Michigan, in the Ozarks, in Western Montana, and in a belt extending from Nebraska into Missouri. Production from these regions is not negligible, but it is not important enough to affect the apple situation as a whole. Illinois has a large crop of early apples. Smaller orchards are to be found in Colorado, Utah, Idaho, and New Mexico. Apples from these orchards are sold for the most part locally, and do not affect the Eastern markets. Other limitations on the relative value of these crops are the varieties of apples grown, their keeping qualities, and ripening dates.

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Regionally, then, apple growing in the United States may be said to be divided between the Eastern and Pacific Northwest areas. <sup>14a/</sup> The former came into bearing earlier than the latter; but, in recent years, it has been outstripped in quantity, quality, and value of apples produced. In smaller costs of production and transportation, however, the East has an advantage over the Northwest, which assures its continuance in the industry.

### Part III - Economic Aspects of the Apple Industry after 1850.

Today the apple is the most important fruit grown in the United States with respect to quantity of crop produced, acreage planted, and total farm value. This is a position the apple has held ever since statistics on fruits have been gathered; and one which it probably will continue to hold despite the increasing competition from citrus fruits. The value of fruit crops varies from year to year depending on several factors: the size of the total crop; consumer preference; local market conditions; and consumer purchasing power. Despite the economic conditions peculiar to each kind of fruit crop and its market, it is interesting to compare the value of apples with six other fruits, whose farm value exceeds \$10,000,000 each year. The years, 1920-1938, using values at 2 year intervals, have been selected for comparison in the following table:

<sup>14a/</sup> Secondary regions, from the point of view of total production, are in the Rocky Mountain regions and in the states of the Middle West. The apples produced, however, are comparable to those states having greater acreage.





TABLE I  
TOTAL FARM VALUE OF SEVEN FRUITS  
AT TWO YEAR INTERVALS

1920-1938  
(In thousands of dollars)

Fruits	1920	1922	1924	1926	1928
Apples	252,967	194,138	193,305	198,355	192,523
Oranges	62,136	63,827	85,391	99,906	92,176
Peaches	98,888	81,662	68,532	69,571	64,137
Grapes	-----1/	-----1/	69,616	65,480	50,218
Strawberries	31,433	36,325	41,197	42,442	42,949
Pears	29,274	22,341	26,843	22,397	25,061
Grapefruit	10,161	9,748	9,306	12,647	14,011
Total	484,859	408,041	494,190	510,808	481,075

Fruits	1930	1932	1934	1936	1938
Apples	160,101	85,801	112,400	98,608	105,725
Oranges	74,431	45,367	71,898	93,599	59,457
Peaches	51,936	21,928	39,920	48,142	39,743
Grapes	45,529	27,776	38,577	41,448	40,073
Strawberries	36,279	24,533	20,200	26,540	30,234
Pears	19,682	8,644	18,820	21,388	15,662
Grapefruit	13,619	8,730	11,683	17,676	12,773
Total	401,577	222,779	323,498	347,401	303,667

1/ Unavailable.

Source: U.S. Department of Agriculture. Agricultural Statistics, 1941, p.185 ff.

This shows that in 1920 the apple crop was roughly four times as valuable as the orange crop. A decline in value occurred between 1920 and 1938 so that in 1930 and 1938 the apple crop was appromimately only twice as valuable. This, of course, was due largely to the general fall in the price level in this

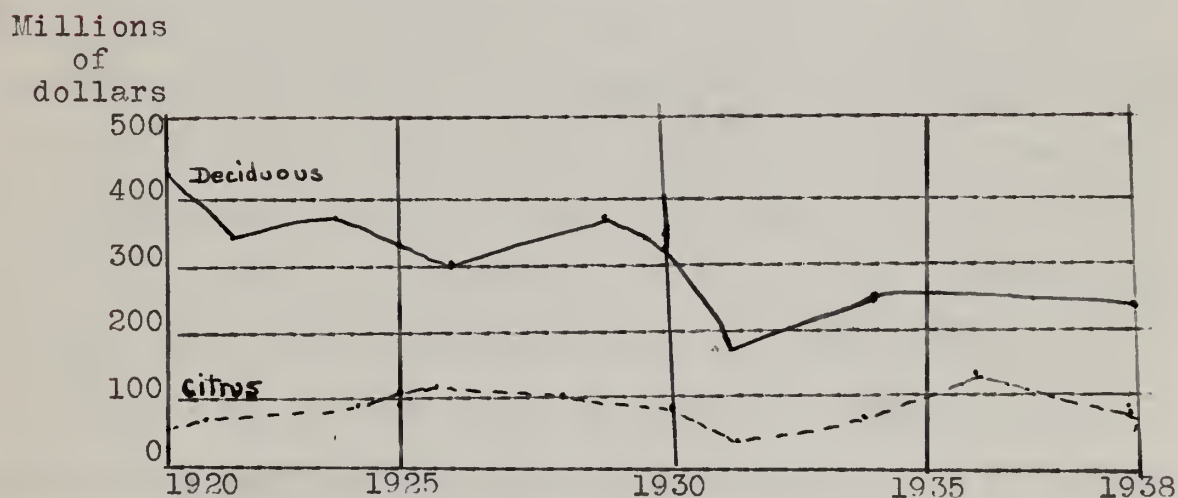




decade; and secondarily, to a rise in the value of citrus fruits.

When the value of the deciduous fruits - apples, peaches, grapes, and pears - is compared with the citrus fruits - oranges and grapefruit - the same trend in values within each group is to be seen. The deciduous fruits fluctuate widely in value; while the citrus group shows a steady tendency to increase or decrease. This is better illustrated by Chart I.

CHART I  
TOTAL FARM VALUE  
OF  
CITRUS AND DECIDUOUS FRUITS  
1920-1938



These illustrations help to show the dominating position of the apple as a fruit, but the question as to how it reached this position and what prospects there are of its staying there need to be examined.



### Demand for Apples.

The simple answer as to how the apple reached its pinnacle as the chief fruit grown in the United States is that the demand for apples caused production to be increased until the total farm value of the apple crop surpassed that of any other fruit. This answer, however, is not quite explicit enough.

In this study, it has been shown that before 1850 the apple was largely a farm and home crop, grown and consumed as cider or fresh fruit on the producing unit. Only a small part of the surplus made its way onto the nearby city or village markets. After 1850, the situation was radically altered by the general increase in demand for all products. This was especially true after the Civil War, when we began to attain the stature of a great industrial nation. The increase in population, wealth, and wages exerted a tremendous energizing effect on every type of economic activity, agricultural as well as industrial. These influences were all closely interlocked: an increase in population meant more workers; more workers meant greater manufacturing and larger national income; and larger national income meant a better market for agricultural products of all kinds, which were needed to feed the increased population. Commercial apple growing has thus a general interdependency with all aspects of our economic life.

Specifically, however, the demand for apples at any one moment exceeds or is less than the current production or the immediate future production. Apple growing is slow to respond





to an increase or decrease in demand; for apple trees require several years after they are planted to reach full bearing. Thus, the economic forces which set in motion plans for increased production may be spent before fruition is attained; and apple growing as a commercial venture is subject to periods of overproduction and underproduction from which it cannot quickly recover.

#### Production.

Production of apples, in following the vagaries of the law of demand, may be measured by the number of bushels produced. Table II shows how relatively little production of apples has changed from 1890 to 1940, the increase being only a little over 60 million bushels.

TABLE II  
PRODUCTION OF APPLES AND POPULATION IN THE  
UNITED STATES, 1890-1940  
(000 omitted)

Census years	Apples, in bu.	Population
1890	80,142 <sup>1/</sup>	62,947
1900	205,930	75,994
1910	141,640	91,972
1920	223,677	105,710
1930	156,617	122,775
1940	140,000 <sup>2/</sup>	131,669

<sup>1/</sup> Figure for 1890 is not typical. Crop failed in this year. Production for 1889 was 143,105 bushels; for 1891, 198,907.  
<sup>2/</sup> Estimated.

Source: U.S. Dept. of Agriculture. Statistics of Agriculture, 1941, and U.S. Bureau of the Census. Sixteenth Census of the United States: 1940, Population, v.1.



When this is compared with the increase in population, which has been rising steadily, it is legitimate to wonder how production has been able to supply the demand. Only because methods of distribution have been more efficient has production been adequate. Where formerly apples were wasted, better methods of marketing and development of by-products now utilize the greater proportion of the crop.

Production may also be measured by the number of trees. In many ways this is a better indicator of potential production as planned by the growers than is the amount of bushels of apples grown. This figure is affected by many things, as for instance, the weather, the care given to the orchard, and the percentage of the crop harvested. Statistics for the number of trees are not available prior to 1910; but from that time we have the necessary data. The number of trees is further broken down into trees of bearing and non-bearing age. This makes it possible to forecast production at least ten or twelve years in advance.

In the following table (Table III) data on trees, classified according to trees of bearing and non-bearing age, may be found for the chief apple growing regions and states for the census years, 1910, 1920, 1930, and 1940:





TABLE III  
NUMBER OF APPLE TREES OF  
BEARING AND NON-BEARING AGE IN  
SIX REGIONS OF THE UNITED STATES,  
1910-1940.

Regions	1910		1920	
	Bearing	Non-bearing	Bearing	Non-bearing
New England	8,219,152	2,094,512	6,351,577	2,123,740
New York	11,575,496	2,828,515	9,636,698	2,932,281
Virginia & West Vir- ginia	11,575,496	6,207,616	12,930,008	4,592,133
Washington	3,009,337	4,862,702	7,964,167	755,898
Oregon	2,029,913	2,240,636	3,315,093	500,322
California	2,482,762	1,054,107	3,128,386	1,143,947
Total	38,564,863	19,288,288	43,325,929	12,048,321

Regions	1930		1940	
	Bearing	Non-bearing	Bearing	Non-bearing
New England	4,799,022	1,779,337	2,903,812	701,581
New York	8,284,507	2,017,203	5,377,131	1,204,430
Virginia & West Vir- ginia	13,086,017	2,373,037	8,302,017	1,390,407
Washington	5,193,571	947,986	3,404,140	271,934
Oregon	1,641,101	218,613	931,873	116,812
California	2,870,417	473,659	1,969,449	173,292
Total	35,864,635	7,809,835	22,888,422	3,858,456

Source: U. S. Bureau of the Census. Fourteenth Census of the United States: 1920, v.5, Agriculture; Sixteenth Census of the United States: 1940, Agriculture, v.3.

It is evident from this table that the number of trees has markedly declined since 1920. More important than total decrease in the number of trees is the small number of non-bearing trees in 1940. Especially noticeable is the small number of young trees in Washington, Oregon, and California, which would indicate





less future production in these states. In fact, the only states with prospects of large production in the next decade are New York, Virginia and West Virginia. <sup>14b/</sup>

Other indicators of production are car-lot shipments and car-lot unloads. Data on car-lot shipments have been collected since 1917, but these are no longer as significant as they were because of the increase in trucking, especially when the hauls are short as in the East and Mid-West. Car-lot unloads, too, should show the quantity of apples going onto a market; but again, the motor truck has mitigated the effectiveness of this as an indicator.

The production data that is available on apples shows that from 1909 the trend is downward, leveling off since 1920. Few new orchards have been set since 1930, which points to an eventual decrease. The trees planted between 1900 and 1920 are at their maximum bearing now. Since 1916, however, a greater proportion of the total crop has been marketed. Competition from citrus fruits has lessened the demand for apples and discouraged production.

#### Domestic Marketing.

This competition has made the apple grower conscious of his markets, which are of two types, the domestic and the foreign. The latter is less important than the former; but it serves to draw off the surplus crop in years when the quantity produced far exceeds the domestic market as in the years of our largest

<sup>14b/</sup> The states of Illinois, Indiana, Kansas and Missouri may be expected to show increased production, particularly early varieties. The new dehydration plants in the Mississippi Valley may stimulate production and provide outlets for the crop.

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harvests, 1914, 1920, 1926, and 1937.

The primary market for apples is the United States, especially in the North Atlantic and North Central cities, centering around New York, Boston, Philadelphia, Cleveland, Detroit, and Chicago. Car-lot unloads for 66 markets show the distribution of the crop by various regions. For the season of 1931-32, distribution was centered in the North Atlantic and North Central Regions mentioned above. The next most important market area was the West. Table IV shows the car-lot unloads by regions for this season.

TABLE IV  
CAR-LOT UNLOADS IN 66 MARKETS OF THE  
UNITED STATES, BY REGIONS,  
1931-32.<sup>1/</sup>

Region	Number of markets	Bushels (in thousands)
North Atlantic	16	11,939
North Central	23	10,680
Western	7	4,276
South Central	7	2,670
South Atlantic	7	1,227
Total	66	30,792

<sup>1/</sup> The most recent season for which data was available by regions.

Source: U. S. Dept. of Agriculture. Technical Bulletin, no.474.

This distribution does not include apples moving into the various markets by boat or truck. In 1928-29, a study made by the Bureau of Agricultural Economics showed that less than 24 per cent of the crop was transported by truck; in 1931-32,





about 35 per cent went by truck. Western apples, because of the long haul involved, are shipped almost wholly by rail and boat; New York and New England apples are now carried largely by truck. If the market is within 200 miles of the producing area, truck shipments are the common mode of transportation. Boston, Philadelphia, and New York are the markets receiving the largest volume of truck shipments. In Table V appear the percentage and number of bushels of apples arriving on these markets from the regions covered in this study, classified according to methods transported.

TABLE V  
REGIONAL SHIPMENTS OF APPLES TO  
THREE MARKETS,  
BY MODE OF TRANSPORT  
1931

(In thousands of bushels)

Regions	Boston			New York		
	Car-lot	Truck	Total	Car-lot	Truck	Total
New England	357	832.2	1189.2	423.7	37.7	461.4
New York	81.9		81.9	1311.4	736.0	2047.4
Virginia & West Virginia	263.6		263.6	895.2	1.0	896.2
Washington	409.0		409.0	3713.5		3713.5
Oregon	9.1		9.1	316.8	9.8	9.8
California	22.7		22.7	141.4	10.6	10.6
Total	1143.3	832.2	1975.5	6802.0	874.7	7576.7
	%	%	%	%	%	%
Percentage relation to total	57.88	42.12	100.0	89.77	11.23	100.0



TABLE V (Cont.)

Regions	Philadelphia		
	Car-lot	Truck	Total
New England	.5		.5
New York	103.4		103.4
Virginia & West Virgin- ia	209.5	7.3	216.8
Washington	1007.7		1007.7
Oregon	9.8		9.8
California	10.6		10.6
Total	1341.5	7.3	1348.8
	%	%	%
Percentage relation to total	99.46	0.54	100.0

From the above table, it is clear that Boston has the greatest number of apples arriving by truck, with 42.12%, and New York has the next largest volume, with 11.23 %. Arrivals by truck at Philadelphia are negligible.

The total domestic market for apples is from 80 to 92 per cent of the total crop marketed; the remainder finds its way into the export trade. In 1938,<sup>15/</sup> the last year of a normal foreign market, the domestic market consumed 83.4 per cent of the total crop, or 1,116,006,520 bushels.

#### Methods of Marketing.

Apples are sold by several methods. Harvesting begins in June and ends in November with the peak coming in September and October. Throughout a thirteen month year, from one June through the following June, the grower markets his crop by

<sup>15/</sup> U. S. Dept. of Agriculture. Agricultural Statistics, 1941, p.185.





one of the following methods: direct selling; selling on consignment; selling the fruit, either packed or on the tree, to cash buyers; and selling through cooperatives.

Direct selling to either the consumer or to a retail dealer is the least important of the various methods. It is practiced locally by the small grower and is most used in the Northeast. Many of the apples sold in this manner during the height of the harvesting season are the seconds and culls, and reach the consumer through roadside stands. These small growers also peddle apples directly to retail outlets in nearby cities, and to consumers who from year to year have the habit of purchasing from one grower. A very small percentage of the quality fruit is marketed in this manner. It would be better for the grower if he turned his second grade apples into by-products, rather than throwing them on the market, thereby lowering the price for the quality fruit.

Selling on consignment, the second method, is widely practiced. Commission firms, who know their markets, receive the apples and sell them for a percentage of the price to other jobbers and retailers. These firms are often of the highest integrity, and their knowledge of marketing conditions makes their services invaluable to the orchardist; often, however, the commission agent is not trustworthy and financially sound. Since the grower must know his broker well before selling on consignment, he customarily deals with only one or two firms with whom he has had satisfactory relations over a period





of years. The drawback to this method of marketing is the uncertainty of the price that may be obtained for the apples, it being the market price on the day of sale, less the brokerage commission.

Fruit brokers dispose of their purchases by selling to jobbers or to retailers; or by receiving apples to sell on commission in the fruit auctions, which are held in 13 large cities. If the apples, usually boxed ones, are to be disposed of by auction, the broker represents the grower. He withdraws the shipment if the price is not satisfactory. Five per cent of the price received is the customary fee for this service.

A third way of marketing the crop is for the grower to sell it to a buyer for cash. These buyers, or their agents, appear in the apple growing regions at harvest time. They generally have a large sum of money deposited in the local banks, from which to make payments to the farmers, who have learned by bitter experience that a check on a distant bank is often not to be trusted. These buyers go from farm to farm and orchard to orchard, bidding for the crop and buying apples in several ways.

These roving buyers will sometimes purchase the fruit on trees, paying the apple grower a flat rate per box or barrel after they have picked and packed the harvest. Again, they may pay the grower so much per unit to handle the crop for them. In this way, they evade having to hire pickers and packers and to supervise the work; the grower, who is used to this task, is often glad to undertake the work for a fee. The obvious draw-

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back to the farmer in selling on the tree is that in a good market year he does not receive premium prices for his best apples. <sup>15a/</sup> The advantages are that the grower in need of money receives immediate payment for his crop, that all costs of marketing are eliminated, and that in a year of a large total crop the orchardist does not have to assume the risks of marketing and price changes.

Another method of the cash buyer is to purchase car-load lots of certain varieties and grades of apples. These are purchased loaded in the car. This is a more satisfactory type of cash purchase both to the grower and buyer, as the element of risk is largely eliminated. Often a grower will sell only part of his crop for cash, thus obtaining funds for his immediate needs and enabling him to hold part of his crop for the probable rise in price in the winter months. The written contract for cash sales is an important guarantee to both parties. Use of it is supplanting the verbal contract, especially in the Northwest, where grower and buyer are often separated by the continent and only occasionally meet through an itinerant agent.

<sup>15a/</sup> Average prices per bushel received by farmers and wholesale prices of apples in New York City, while not strictly comparable are interesting to illustrate the difference between the amount received by the grower and the market price. The difference between these two prices may be assumed to cover the costs of marketing. From the following table, the average costs of distribution for the ten year period, 1931-1940, may be computed as \$.46:





Selling through cooperatives and associations, the last important type of marketing, has reached the highest degree of development in the Northwest. The Northwestern grower, because of his problems of increasing production, distance from markets, intensive specialization of crop, and high land values, has felt the need of organization more keenly than the individual

15a, Cont./

APPLE PRICES PER BUSHEL, 1931-1940

	United States (Received by farmers)	New York City (Wholesale price)	Marketing Costs
1931	\$.66	\$1.34	\$.68
1932	.60	1.01	.41
1933	.78	1.59	.81
1934	.89	1.45	.56
1935	.72	1.04	.32
1936	1.05	1.66	.61
1937	.67	.94	.27
1938 <u>1/</u>	.83	1.28	.45
1939 <u>1/</u>	.64	1.02	.38
1940 <u>1/</u>	.81	1.27	.46

1/ Preliminary

Source: U.S. Dept. of Agriculture. Agricultural Statistics, 1941, p.189.

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Eastern grower. These groups were first formed about 1910, and reached their present form of development about 1920. <sup>15b/</sup>

The cooperative form of organization is of two kinds, the stock corporation and the non-stock system. The second is the better and more purely cooperative both in spirit and in form. Under this, each grower has an equal vote and share in the venture, while in the stock corporation, there is danger of the ownership and control drifting into the hands of a few.

Activities of the cooperatives extend from purchasing and selling supplies, fertilizers, farm tools, boxes, and wrappings, to centralized uniform packing, advertising, pooling of fruit, and selling. Good management is a prerequisite for a successful cooperative; and many a one has failed for lack of it. All politics need to be kept out of a cooperative, which flourishes best where its members are intelligent, socially minded individuals. Profits from a cooperative are customarily divided according to both membership and amount of fruit sold.

Pooling of apples for marketing purposes has led to the formation of associations. These differ from cooperatives in that they are for marketing purposes only, and that the profits, if any, belong to the association, the owners of which may very well not be the growers. The grading and handling of large quantities of apples has definite advantages, including all the economies of large-scale enterprises. Not the least of these is the advantage of being able to sell under a brand name.

<sup>15b/</sup> See page 35a.



15b/ Cooperative organizations of apple growers have been many, and the majority have been short lived. The more successful cooperatives are to be found in the Northwest and in Colorado. There are only a few in the East, and they play only a very minor part in marketing the Eastern crop. Among the more famous cooperatives are the following:

Skookum Packers - Until 1922 in association with the Northwestern Fruit Exchange and distributors of "Skookum Apples".

Yakima Fruit Growers Association - Distributors of the "Big Y " apples.

Apple Growers Association of Hood River, Oregon, - Marketers of "Hood River Apples".

Wenatchee District Cooperative Association - Owners and sellers of "Jim Hill" and "Jim Dandy" brands.

Nashoba Valley Cooperative Association - One of the few New England cooperatives and distributors of "Nashoba Apples".



1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the transparency and accountability of the organization. This section also outlines the various methods used to collect and analyze data, ensuring that the information is reliable and up-to-date.

2. The second part of the document focuses on the implementation of the proposed changes. It details the steps involved in the transition process, from the initial planning phase to the final execution. This section also addresses the potential challenges that may arise during the implementation and provides strategies to overcome them.

3. The third part of the document discusses the impact of the proposed changes on the organization's overall performance. It highlights the expected benefits, such as increased efficiency and cost savings, and provides a detailed analysis of the potential risks. This section also includes a timeline for the implementation of the changes and a list of the key personnel responsible for each stage of the process.

4. The fourth part of the document provides a summary of the findings and conclusions. It reiterates the importance of the proposed changes and the need for continued monitoring and evaluation. This section also includes a list of recommendations for future research and a final statement of the author's commitment to the success of the organization.

### Advertising.

An interesting development from cooperatives and marketing associations has been national advertising for the apple. About 1920, apple growers in the Northwest began to see the effective advertising of California citrus growers, and realized that to preserve their markets they must do likewise. The first major attempt was the advertising of "Skookum Apples", the brand name used by the Northwest Marketing Association. A campaign was inaugurated in the South Central Markets, with special emphasis on Texas. The result was <sup>16/</sup> that sales of all apples jumped, but sales of Washington apples simply leaped in comparison.

This early advertising was continued sporadically until 1934, when growers in the state of Washington banded together and passed a law levying a cent per box on all apples sold, to be used for concerted advertising of Washington apples. The Eastern grower has felt the effect of this in his markets; and in the last few years, he also has begun to think about advertising his apples. The deterrent here is the lack of associations of growers. Except for Nashoba Apples, and a few brands from the Hudson River Valley orchardists near Red Hook, eastern apples are not known by name. Competition in the postwar world is going to force effective advertising on all apple growers unless we

<sup>16/</sup> Agnew, Hugh E. How Skookum Apple Advertising Helped the Industry. In Printers' Ink, v.118, no.10, March 9, 1922, p.92-100.



can develop extensive foreign markets.

#### Processed Apples.

Until 1936, the United States Department of Agriculture included only apples sold as fresh fruit in the commercial crop. but since that date, apples sold to processors have been included. Processors' purchases include apples made into vinegar, dried, canned, preserved as jam, etc. Recently, apple honey and apple juice have joined the list of apple products. The apples disposed of thus remove the culls and seconds from the market, and their absence is a factor influencing considerably the price of quality apples.

The making of cider vinegar is probably the oldest manufacturing use for apples. In recent years, it has reached sizable commercial proportions, and disposed of much of the poorer fruit. Most vinegar makers insist, of course, on sound apples, but they will accept skin blemishes and fruit which is poorly shaped and of small size.

Apple drying and canning is centered in two states, New York and California. Production of dried apples has declined over the years, while that of canned apples, chiefly in the form of apple sauce and jelly, has risen. Canning of apples, however, has not increased nearly so much as canning of other fresh fruits. The following table (Table VI) shows the production of canned and dried apples in terms of fresh fruit for 1920, 1925, 1930, and 1940:





TABLE VI  
CANNED AND DRIED APPLES IN THE UNITED STATES,  
AT FIVE YEAR INTERVALS,  
1920-1940

(In thousands of bushels of fresh fruit)

Year	Canned	Dried
1920	3,791	5,979
1925	7,492	6,125
1930	6,268	7,671
1935	5,867	7,525
1940	6,968	3,500

Source: U. S. Dept. of Agriculture. Agricultural Statistics, 1941, p.185.

Two new developments in the processing of apples are the technical method for the canning of apple juice and for the making of apple honey. The former was brought onto the market by the evolving of a vacuum method of treatment about 1935. Previously, canning by ordinary pasteurization had been tried, but was found to destroy the delicate flavor and render the product unpalatable. The second innovation is the use since 1939 of concentrated apple juice, or "apple honey", instead of glycerine, as a moistening agent in the manufacture of cigarettes. Whether this will continue to be used when normal supplies of glycerine again become available is questionable.

The regional laboratories of the U. S. Department of Agriculture, and also the Virginia growers, are very anxious to find new uses for apples to alleviate poor market conditions. Attempts have been made at producing various apple candies and



confections, but so far these have not been widely accepted. The Virginia growers are vitally concerned with this problem because of the earlier maturing date of their crop and its poorer keeping qualities.

#### Foreign Markets.

The export market for apples, in contrast to the domestic, is almost negligible, amounting, in 1938, to 16.2% of the total crop. Exportation of apples, however, began very early in the history of commercial apple growing and had assumed sizable proportions by 1900. Since then, the amount of apples exported has varied greatly, being affected not only by world economic conditions but also by political events. <sup>16a/</sup>

Northern European countries, notably Great Britain and Germany, have absorbed most of our exports of apples. During World War I, exports declined to a mere trickle; in the present war, the same situation exists. Again, as we did in 1916-1918, we are attempting to develop a South American market. The period from 1920 to 1929 saw a good export trade in apples; after 1929, the world depression and emphasis in Britain on "imperial preference" lost us our primary market. "Eat Empire Fruit" became the slogan in England, and apples from Nova Scotia and Australia adequately supplied both the fall and spring markets. Australian apples, which came onto the English market in the spring, especially affected the sale of our cold-storage apples.

<sup>16a/</sup> See page 39a.

1875-1876. The following is a list of the names of the persons who were members of the Board of Directors of the City of New York during the year 1875-1876.

1875-1876. The following is a list of the names of the persons who were members of the Board of Directors of the City of New York during the year 1875-1876.

### MEMBERS OF THE BOARD OF DIRECTORS

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16a/ A minor, but not less important, factor affecting the export market has been the problem of spray residues of arsenic and lead. Spraying for fruit pests in the United States became a universal practice between 1919 and 1929. This was due both to a desire to grow more perfect fruit and to the increase in destructive insects.

The first cry against spray residues rose in Boston in 1923; then, Washington, D.C. joined Boston in her stand. Next, came the 1925 crop and the accompanying scare in England, where no fruit of any kind could be offered carrying more spray residue than .01 grain of arsenic per pound of fruit. The British government sent their Minister of Health to confer with our government about the marketing of the 1926 crop. As a result, the Bureau of Chemistry warned the growers that all fruit, including that for the domestic market, must be cleaned; but no tolerance was defined.

Development of cleansing machinery for washing apples with a dilute solution of hydrochloric acid and for wiping and brushing followed. The latter proved ineffective.

After 1927, and the passage of the British "Destructive Insects and Pests Act", attention to spray residues declined until 1933. The specter was again raised to public attention by the publication in Industrial and Engineering Chemistry, June 1933, of "Significance and Danger of Spray Residues" by C. N. Myers and others. This was subsequently reprinted and had wide



1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in financial reporting.

2. The second part of the document outlines the various methods and techniques used to collect and analyze data. It includes a detailed description of the experimental procedures and the statistical analysis performed.

3. The third part of the document presents the results of the study. It includes a series of tables and graphs that illustrate the findings of the research. The data shows a clear trend of increasing activity over time.

4. The fourth part of the document discusses the implications of the findings. It suggests that the results have significant implications for the field of study and may lead to further research in this area.

5. The fifth part of the document provides a conclusion and summarizes the main points of the study. It reiterates the importance of accurate record-keeping and the need for ongoing research in this field.

circulation. Consumers Research, Inc. took up the gauntlet at this point; and they have done a great deal to inform their subscribers and the general public about the dangers of eating fruit sprayed with poisons.

On the whole the campaigns against residues in this country have not been too successful. Much improvement is desirable; but is held back by lack of a cheap, effective method of removing the residue. Washing apples adds materially to the costs of production, and the growers just are not going to spend money on it until they are forced to do so. In this respect, much blame can be placed on our public health experts, who have not been sufficiently interested or eager enough to fight for clean apples.

In Europe, the situation is much better. Apples now going into the export trade are cleansed and meet the tolerance requirements of the importing country. The tax in Great Britain on sprayed apples contributes to the nation's health as well as to its finances. The English "Food and Drug Act" of 1938 applies to imported food as well as to domestic conditions and carries on the earlier provisions of the 1927 act.

It must be admitted that foreign insistence on clean apples has been a deterrent to the export trade. Yet the growers have still found it profitable to clean apples for this market. Proof of this is found in the prevalence of washing devices in the chief exporting states such as California and Washington.

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5. The fifth part of the document concludes the study. It summarizes the main findings and provides a final statement on the importance of the research.

6. The sixth part of the document includes a list of references to the sources used in the study. It also includes a list of figures and tables that are included in the document.

7. The seventh part of the document includes a list of appendices. These appendices provide additional information and data that are not included in the main body of the document.

8. The eighth part of the document includes a list of footnotes. These footnotes provide additional information and clarification on the content of the document.

9. The ninth part of the document includes a list of acknowledgments. These acknowledgments thank the individuals and organizations that provided support and assistance during the study.

10. The tenth part of the document includes a list of contact information. This information provides a way for others to reach out to the author for more information or to request a copy of the document.

Apples for the export trade are usually barreled; but since 1922, many boxed apples from the Northwest have been shipped. The following table (Table VII) shows the amount of apples exported and the percentage of the total crop sold abroad since 1920;

TABLE VII  
TOTAL EXPORTS OF APPLES AND PER  
CENT OF PRODUCTION,  
1920-1939.

Year	Exports (1,000 bu.)	Percentage of Crop.
1920	10,466	5.1
1921	3,686	3.9
1922	6,943	3.7
1923	16,789	9.3
1924	12,863	8.0
1925	15,101	9.9
1926	26,647	11.6
1927	13,013	11.2
1928	29,372	16.5
1929	14,269	10.6
1930	26,437	16.9
1931	23,246	11.3
1932	20,186	13.7
1933	18,985	12.8
1934	12,166	11.7
1935	18,166	12.9
1936	10,564	10.9
1937	15,511	9.9
1938	17,761	16.2
1939	6,137	4.3

Source: U. S. Department of Agriculture. Agricultural Statistics, 1941, p.185.

It can be seen from the above table that the year in which we exported the greatest percentage of our crop was 1930, that this percentage declined during the next few years, and that

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it was just beginning to rise again when the momentous events of 1938 and 1939 descended on the world.

#### Prices of Apples.

The price that is obtained by the grower for his apple crop depends on many things: the supply of apples, the general price level, the kind of apple offered for sale, the quality of the fruit, the **type** of container, the market where it is sold, and the method of sale. The orchardist, like the grower of other crops, can little foretell the value of his apples when he sees the first buds unfolding in the spring.

Seasonal farm prices of apples have ranged from about \$.62 a box in 1914 to \$3.50 in 1943. Boxed apples bring a better return than barreled apples. They are also more suitable for the urban life of today; a dweller in an apartment has room for a box of apples, but not for a barrel. For these reasons, the practice of packing in boxes has increased since 1922; and price data is now based on the box rather than the barrel.

Index numbers of apple prices are based on the 1910-14 average of all farm crops, which is used for farm parity prices. In terms of this average, western growers have recently been in a less favorable position than eastern orchardists with respect to prices alone. The Bureau of Agricultural Economics of the U. S. Department of Agriculture has recently concluded a study, Index Numbers of Prices Received by Farmers, 1910-1943, February 1944. From this the following table (Table VIII) has been selected:



TABLE VIII  
 INDEX NUMBERS OF PRICES RECEIVED BY  
 FARMERS FOR ALL FARM PRODUCTS AND FOR FRUITS,  
 AVERAGE BY YEARS,  
 1910-1943.

(August 1909-July 1914 = 100)

Year	All Farm Products	Fruits
1910	102	100
1911	94	102
1912	99	98
1913	102	108
1914	101	87
1915	99	82
1916	118	98
1917	175	114
1918	204	163
1919	215	170
1920	211	178
1921	124	151
1922	132	160
1923	143	129
1924	143	123
1925	156	158
1926	146	134
1927	142	134
1928	151	152
1929	149	125
1930	128	146
1931	90	91
1932	68	73
1933	72	70
1934	90	88
1935	109	82
1936	114	92
1937	122	104
1938	97	70
1939	95	68

No.		Date		Description		Amount	
1		1890	Jan 1	Balance		100.00	
2		1890	Feb 1	Interest		5.00	
3		1890	Mar 1	Interest		5.00	
4		1890	Apr 1	Interest		5.00	
5		1890	May 1	Interest		5.00	
6		1890	Jun 1	Interest		5.00	
7		1890	Jul 1	Interest		5.00	
8		1890	Aug 1	Interest		5.00	
9		1890	Sep 1	Interest		5.00	
10		1890	Oct 1	Interest		5.00	
11		1890	Nov 1	Interest		5.00	
12		1890	Dec 1	Interest		5.00	
13		1891	Jan 1	Balance		100.00	
14		1891	Feb 1	Interest		5.00	
15		1891	Mar 1	Interest		5.00	
16		1891	Apr 1	Interest		5.00	
17		1891	May 1	Interest		5.00	
18		1891	Jun 1	Interest		5.00	
19		1891	Jul 1	Interest		5.00	
20		1891	Aug 1	Interest		5.00	
21		1891	Sep 1	Interest		5.00	
22		1891	Oct 1	Interest		5.00	
23		1891	Nov 1	Interest		5.00	
24		1891	Dec 1	Interest		5.00	
25		1892	Jan 1	Balance		100.00	
26		1892	Feb 1	Interest		5.00	
27		1892	Mar 1	Interest		5.00	
28		1892	Apr 1	Interest		5.00	
29		1892	May 1	Interest		5.00	
30		1892	Jun 1	Interest		5.00	
31		1892	Jul 1	Interest		5.00	
32		1892	Aug 1	Interest		5.00	
33		1892	Sep 1	Interest		5.00	
34		1892	Oct 1	Interest		5.00	
35		1892	Nov 1	Interest		5.00	
36		1892	Dec 1	Interest		5.00	
37		1893	Jan 1	Balance		100.00	
38		1893	Feb 1	Interest		5.00	
39		1893	Mar 1	Interest		5.00	
40		1893	Apr 1	Interest		5.00	
41		1893	May 1	Interest		5.00	
42		1893	Jun 1	Interest		5.00	
43		1893	Jul 1	Interest		5.00	
44		1893	Aug 1	Interest		5.00	
45		1893	Sep 1	Interest		5.00	
46		1893	Oct 1	Interest		5.00	
47		1893	Nov 1	Interest		5.00	
48		1893	Dec 1	Interest		5.00	
49		1894	Jan 1	Balance		100.00	
50		1894	Feb 1	Interest		5.00	
51		1894	Mar 1	Interest		5.00	
52		1894	Apr 1	Interest		5.00	
53		1894	May 1	Interest		5.00	
54		1894	Jun 1	Interest		5.00	
55		1894	Jul 1	Interest		5.00	
56		1894	Aug 1	Interest		5.00	
57		1894	Sep 1	Interest		5.00	
58		1894	Oct 1	Interest		5.00	
59		1894	Nov 1	Interest		5.00	
60		1894	Dec 1	Interest		5.00	

TABLE VIII (Cont.)

Year	All Farm Products	Fruits
1940	100	73
1941	124	85
1942	159	114
1943	192	179

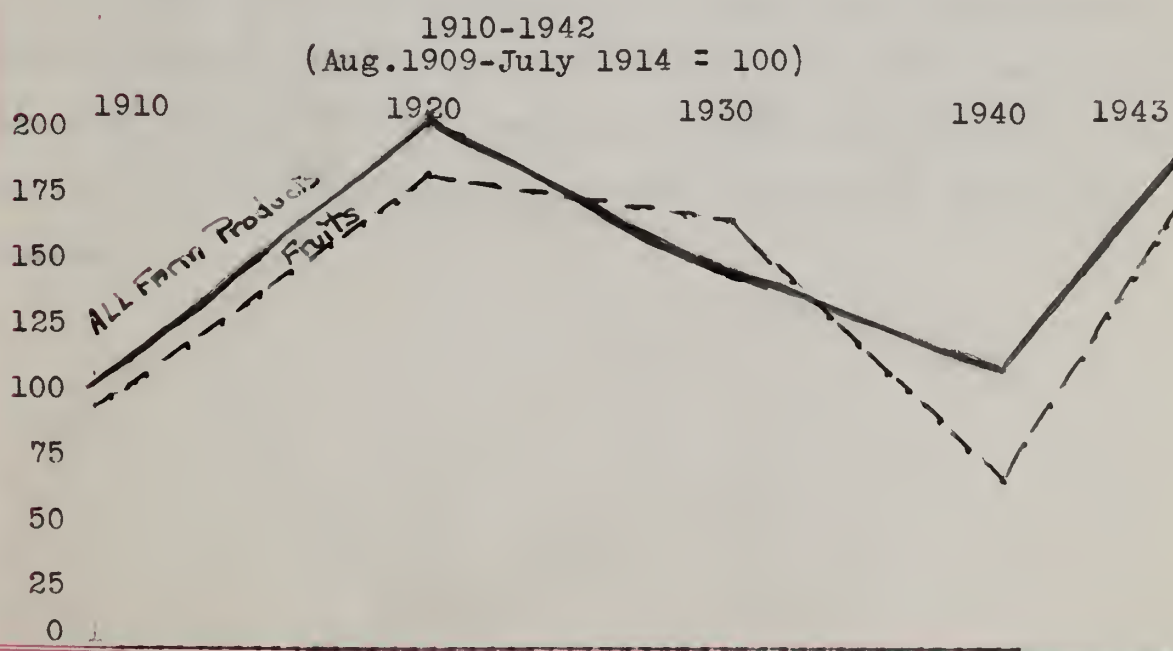
This shows that, except during World War I and the depression years of the 1930's, all farm prices have been above the parity level. It is also interesting that during the depth of the depression, 1931-1934, the index numbers for prices of fruit were higher than that for all farm products. On the whole, however, the index numbers for fruits are just about half as high as those for all agricultural products. The following chart illustrates this.

CHART II

## INDEX NUMBERS OF ALL FARM PRODUCTS

COMPARED WITH THOSE FOR

FRUITS





THEORY OF THE EARTH

CHAPTER I

The earth is a sphere, and its surface is divided into two parts, the land and the water. The land is divided into continents and islands, and the water is divided into oceans and seas. The earth is covered with a thin layer of air, and the air is divided into different layers. The air is also divided into different parts, and the parts are called the atmosphere, the hydrosphere, and the lithosphere. The atmosphere is the layer of air that surrounds the earth, and the hydrosphere is the layer of water that covers the earth. The lithosphere is the layer of rock that makes up the earth's crust.

THE EARTH'S CRUST

THE CRUST

THE CRUST IS THE THIN LAYER OF ROCK THAT MAKES UP THE EARTH'S SURFACE.

IT IS DIVIDED INTO TWO PARTS, THE CONTINENTAL CRUST AND THE OCEANIC CRUST.

THE CONTINENTAL CRUST

THE CONTINENTAL CRUST IS THE THICKER PART OF THE CRUST, AND IT IS MADE UP OF GRANITE AND GNEISS.

IT IS ABOUT 30 KILOMETERS THICK.



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All of these factors - price, market conditions, the supply, and the demand for apples - affect the economic condition of the apple industry. Today, since we are in the midst of a war economy, markets, prices, and demand are maladjusted; what to-morrow will bring to the industry is not clear. Before the present war broke out, the apple industry was in neither a very good nor a very bad condition. Production was declining, somewhat commensurate with the slackening increase in population; demand was falling off, due somewhat to the foregoing reason, but also to competition from the citrus fruits; and market conditions were poor, because the Eastern markets were glutted with apples coming especially from the Virginias. On the other side of the balance sheet were several hopeful signs: new uses for apples were being developed, an adequate export market was growing under the Hull trade agreements program, and expansion of the market was being attempted through better coordinated advertising. It would seem that in 1938, the apple industry was reaching a point of equilibrium and normal production in relation to the economic conditions then existing in the United States.



### Conclusions.

From the story of the growth of the apple industry in the United States some deductions may be made.

First, the industry has followed both the agricultural and industrial development of the country. The early orchards were a part of the simple colonial economy; later, as the country developed, apple growing increased; now, commercial apple raising is as specialized an industry as any other large-scale enterprise to be found today.

Second, the apple industry is conducted in those regions best suited naturally to the growing of apples. Climatic conditions of air drainage, soil, sun, and availability of water have the determining forces. Nearness to markets has not been an essential factor, although development in some regions, notably the West, was held up until transportation became available.

Third, the raising of apples is beset with the economic ills of most agricultural industries. Primary among these is disposal of the crop in a year of abundance. So far, the problem of extension of the market has not been solved, although concerted advertising and exports would do much to mitigate overproduction due largely to the bounty of nature.

Fourth, the industry, itself, has an economic characteristic that intensifies its problem of production. This is its slowness in responding to changes in demand. Because of the time required for an apple tree to reach bearing age, an in-





crease in demand may not be filled until some five to ten years after it is initiated. By this time, the increase may have changed to a decrease in demand with a resultant problem of overproduction.

Fifth, competition from citrus fruits, especially since 1920, has cut deeply into the market for apples. How effectively this problem can be met depends on the ability of growers to organize, and thus by united efforts to enlarge their now contracting markets.

Sixth, a vigorous foreign market for apples is needed to draw off surplus crops. Through trade agreements or active promotion in potential markets such as South America, the export trade should be expedited.

Seventh, the orchardist has been both fortunate and unfortunate in the prices he has obtained for his crop. Index numbers for fruits in relation to those for all farm products show that the prices for fruits generally lag behind those for other crops. On the other hand, in the depression years, fruits brought better prices than other types of farm produce.

Finally, comes the problematical guess as to the future growth and condition of the industry. At the beginning of the present war, production and demand for apples were declining. The industry was no longer young and growing. Methods of production had changed from extensive to intensive; and apples were a highly specialized farm crop. After the war, it would seem as if these trends might continue, with the industry



eventually attaining a rate of production that would be commensurate with the demand and the existing markets for apples.



## THE APPLE INDUSTRY IN THE UNITED STATES.

### An Abstract.

The apple industry, a manifestation of our economic life, gives the student an opportunity to examine its characteristics and development from its simple beginnings to the present.

The apple was originally wild, and indigenous to all parts of the Northern Hemisphere; but sometime in the distant past, our ancestors developed the cultivated apple much as we know it today. This was brought to the United States by the colonists.

Once on our shores, the apple was grown in every home orchard up and down the Atlantic Seaboard, to provide cider for drinking and fruit for the table. After the Revolutionary War, in the period of our westward expansion, the apple spread throughout the nation. Since this was a time of great improvements in horticulture, varieties of apples multiplied, commercial nurseries were started, and the beginnings of large orchards, grown for profit, were to be found.

After 1850 came the development of commercial apple growing. This coincided with the increase in all large-scale agricultural enterprises, such as the raising of wheat, tobacco corn, and other major crops.

The apple industry developed widely in the regions which were best suited to its culture. The earliest regions to have large orchards were New York, New England, and Oregon. Later, in the West, with the arrival of the railroad and irrigation,





came the large, intensive, specialized apple orchards of Washington. A third state in the West to develop large orchards was California. About 1900, large plantings were made in the Shenandoah-Cumberland region of Virginia and West Virginia. Secondary regions include the Ozarks, Western Montana, Colorado, and other smaller areas.

Regionally, the industry is centered on the Eastern and Western seaboard; but the leadership for quality and production now goes to Washington, a position held before 1917 by New York. Orchards in New England are declining, while production from the Virginias is increasing. California apples go largely to the export trade or to processing plants, as the yellow variety grown is not a favorite on the domestic market.

Apples are our most important fruit crop in terms of farm value. In 1938, this was over 105 million dollars; its nearest competitive crop, oranges, was valued at about 56 million dollars. Despite this overwhelming lead, the value of the apple industry has markedly declined from its value in 1920 of over 252 million dollars. This is due to a fall in the general price level and to competition from citrus fruits.

The reason for the high value of the apple crop is the great demand for the fruit. This is largely because of the increase in population, wages, and national income. Apple growing is slow to respond to changes in demand; thus, the industry is subject to periods of overproduction and underproduction.



Production, and especially potential production, may be measured by the number of bearing and non-bearing trees. The number of trees has been declining for some years, although the quantity of apples produced is still high because trees, which were planted around 1910, are now reaching their maximum bearing. Future prospects are for a marked reduction in production unless foreign markets are expanded.

The domestic market, however, is the outlet for most of our apples. These are shipped to the chief cities of the North Atlantic and North Central states by rail, truck, and boat, the majority coming by railroad in car-lot shipments.

Apples are disposed of on the market by direct selling, selling on consignment, selling to cash buyers at harvest time, and selling through cooperatives and marketing associations. The latter have reached their greatest development in the Northwest, where specialization of crop and distance from markets has forced the growers to sell their fruit as a unit.

From these associations for marketing purposes have come various attempts to advertise apples. These have been sporadic. At present, the state of Washington levies a tax on all boxes of apples sold to provide funds for advertising. Advertising of apples is a necessity for the future, if the orchardist is to cut the competition given by the citrus fruits.

Another way for the orchardist to extend his market is to turn more seconds and culls into vinegar, or into canned and dried apples. Two new processed products, apple juice and "apple





honey", have been developed for this purpose. Virginia growers are keenly interested in by-products, as their crop has to be disposed of at the height of the harvest season, when prices tend to be lowest.

The foreign market absorbs up to 16% of the total crop and helps to maintain the price structure of the domestic market. A good export market would help to care for the Virginia apples and to absorb overproduction in years of large crops. Great Britain and Germany are normally our largest customers.

Prices received for apples are governed by the quality and variety of the apples, the size of the crop, the condition of the domestic and foreign markets, and many other factors. A comparison of the index numbers for all fruits and for all farm products indicates that fruit prices tend to follow farm products, the index number for prices of fruits being about half as high as the general index number. In the 1930's, fruit prices were in an unusually favorable position in relation to other farm prices.

All of these historical facts and economic characteristics of the apple industry help to explain its place in our national scheme of life. It would be hazardous to foretell the future of the industry; but it may be ventured that ~~maximum~~ development has now been reached and the future will see the industry either in a state of equilibrium or of decline.



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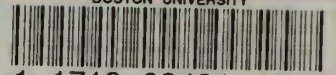








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